

SUPPORT FOR THE AMENDMENTS

This Amendment adds new Claims 37-40. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 37 is found in the specification at least at page 26, lines 20-23. Support for Claim 38 is found in the specification at least at page 13, lines 6-14. Support for Claims 39-40 is found in Claim 26 and in the specification at least at page 16, lines 13-15. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 26-40 will be pending in this application. Claim 26 is independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

Applicants thank the Examiner for the indication that Claims 28-29 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Office Action at page 6, section 7. However, as discussed below, Applicants respectfully submit that all of the pending claims are allowable.

The present invention provides a chemical mechanical polishing process that comprises polishing an interlayer insulating film using an aqueous dispersion which comprises a scratch inhibitor and an abrasive comprising organic/inorganic composite particles. Each of the organic/inorganic composite particles has an organic particle and an inorganic particle, with zeta potentials of opposite signs, bonded by electrostatic force to an extent that the organic and inorganic particles of each organic/inorganic composite particle do not to easily separate during the polishing process. Specification at page 14, lines 4-8; page 15, lines 4-7.

Claims 26, 30, 32 and 34-35 are rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 5,876,490 ("Ronay") in view of U.S. Patent No. 5,990,012 ("Robinson"). In addition, Claim 27 is rejected under 35 U.S.C. § 103(a) over Ronay and Robinson and further in view of U.S. Patent No. 6,420,269 ("Matsuzawa"). Claims 31 and 36 are rejected under 35 U.S.C. § 103(a) over Ronay and Robinson and further in view of U.S. Patent No. 6,447,563 ("Mahulikar"). Claim 33 is rejected under 35 U.S.C. § 103(a) over Ronay and Robinson and further in view of U.S. Patent No. 6,217,416 ("Kaufman").

Ronay discloses a polishing slurry that can contain inorganic abrasive particles and a polyelectrolyte that adsorbs on and coats only a fraction of the abrasive particles. Ronay at column 2, lines 22-25; column 7, lines 27-45. In alternative embodiments, the coated abrasive particles can be replaced with non water-soluble polymer or with surfactant micelles. Ronay at column 7, lines 59-61; column 8, lines 6-8. Ronay's Fig. 3 shows that the uncoated inorganic abrasive particles are not bonded by electrostatic force, as required by Claim 26, to the coated abrasive particles, non water-soluble polymer or surfactant micelles.

Regarding the slurry containing polyelectrolyte coated abrasive particles, Ronay discloses that the polyelectrolyte has ionic moieties of a charge different from the ionic charge associated with the abrasive particles. Ronay at column 4, lines 56-58. Ronay discloses that the term polyelectrolyte refers to a substance that contains polyions, which are macro-molecules having a large number of ionizable groups. Ronay at column 4, lines 65-67. Polyions that are highly attracted to the surface of the abrasive particles achieve adsorption behavior of the Langmuir type, and the polymer lies flat on the surface of the abrasive particle until a "monolayer" coverage is achieved. Ronay at column 3, lines 43-47. In order to polish elevated areas of a substrate faster than recessed areas and thus achieve improved planarization, Ronay discloses that the polishing slurry must contain both inorganic abrasive particles that are uncoated, and inorganic abrasive particles that are coated with a

monolayer of the polyion polymer. Ronay at column 2, lines 7-12; column 3, line 64, to column 4, line 27.

However, Ronay fails to suggest the independent Claim 26 limitation that "said abrasive comprising organic/inorganic composite particle has an **organic particle** and an inorganic particle with zeta potentials of opposite signs bonded by electrostatic force".

The secondary references fail to remedy the deficiencies of Ronay.

Robinson is cited for suggesting an insulating film having an elastic modulus of no larger than 20 GPa. Office Action page 3, lines 5-8.

Matsuzawa is cited for disclosing a non-ionic surfactant. Office Action at page 4, section 4, lines 5-8.

Mahulikar is cited for disclosing an oxidizing agent of hydrogen peroxide. Office Action at page 4, section 5, lines 4-7.

Kaufman is cited for disclosing use of another scratch inhibitor, other than the surfactant. Office Action at page 5, section 6, lines 5-6.

However, the secondary references fail to suggest the independent Claim 1 limitation, absent from Ronay, that "said abrasive comprising organic/inorganic composite particle has an organic particle and an inorganic particle with zeta potentials of opposite signs bonded by electrostatic force".

Because the cited prior art fails to suggest all the limitations of independent Claim 26, the rejections under 35 U.S.C. § 103(a) should be withdrawn.

New Claims 37-40 are further patentably distinguishable over the cited prior art.

In particular, Ronay's composite particle comprising an organic monolayer covering an inorganic abrasive particle fails to suggest the Claim 37 limitation that "said organic/inorganic composite particle is one where said inorganic particle is adhered to a surface of said organic particle".

Furthermore, Ronay fails to suggest the organic particle polymers featured in Claim 38.

Moreover, Ronay and the secondary references fail to suggest new Claims 39-40. The "consists of" limitation of Claims 39-40 excludes from the recited "abrasive" the uncoated inorganic abrasive particles required by Ronay.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.


Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 08/03)


Corwin P. Umbach, Ph.D.
Registration No. 40,211